

$$x = \frac{3x^2}{4y}$$

Strategy 1:  $\frac{d}{dx}(x) = \frac{d}{dx}\left(\frac{3x^2}{4y}\right)$

$$= \frac{6x \cdot 4y - 3x^2 \cdot 4y'}{(4y)^2}$$

Simplify  $\rightarrow$

Strategy 2:  $x = \frac{3x^2}{4y} \quad | \cdot 4y$

$$4xy = 3x^2$$

$$\frac{d}{dx}(4xy) = \frac{d}{dx}(3x^2)$$

$$4y + 4xy' = 6x$$

Simplify  $\rightarrow$

strategy 3: solve for  $y$  first:

$$x = \frac{3x^2}{4y}$$

$$4xy = 3x^2$$

$$y = \frac{3x^2}{4x}$$

$$(*) y = \frac{3}{4}x$$

differentiate  $\rightarrow y' =$

To show #1, #2, #3 give the same answers, simplify  $y'$  for #1 and #2 by expressing it only in terms of  $x$ ; that is; replace every " $y$ " with  $(*)$

to get a new expression for  $y'$  that will be the same as  $y'$  from #3